



**Northwest Center  
Health Services R&D**

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# Northwest Center for Outcomes Research in Older Adults

## A VA HSR&D Center of Excellence

### Identifying organizational characteristics that impact the medication adherence of VA patients with diabetes

Daily, ongoing oral drug therapy is a major component of medical treatment for most patients with diabetes and can reduce diabetes-related complications. These preventative medications can be effective when taken as prescribed, but adherence to the medications and the medication regime is poor among diabetes patients. Within VA, poor medication adherence by veterans with a chronic condition, such as diabetes, adversely affects disease control, increases the risk of hospitalization, and escalates healthcare costs over the long term.

Patient-level factors that impact medication adherence are well-documented. Demographic characteristics, disease severity and co-existing conditions, medication regime complexity, number of concomitant medications, adverse effects, costs, and personal beliefs about medication efficacy are associated with poor medication adherence.

In contrast, organization-level factors that impact medication adherence are relatively unknown. Identifying and addressing organizational barriers to medication adherence at a systems level may be an effective way to improve adherence among vulnerable populations. Facility-level factors such as improved clinical informatics systems, stronger provider and patient education, easier patient access to providers and pharmacy care, or special quality improvement programs for specific diseases may positively impact medication adherence.

The HSR&D funded study *Organizational Correlates of Adherence to Medication (OCAM)*

IIR 07-068, lead by Northwest Center Core Investigators Chris Bryson and Chuan-Fen Liu, represents a chance for VA to both identify and better understand these organizational characteristics.



**Christopher L. Bryson, MD, MS**

This mixed-methods research project is a collaborative effort involving HSR&D Centers of Excellence in Seattle, Ann Arbor, and Durham. Study findings may be applicable to medication adherence within other chronic conditions.

## PROCESS

Aim 1 quantifies the variation in facility-level medication adherence for patients with diabetes among VA facilities nationally, including VA Medical Centers (VAMCs) and Community Based Outpatient Clinics (CBOCs), and identifies high and low performing facilities.

Aim 2 identifies modifiable organizational factors associated with variation in medication adherence. This will be accomplished in two ways. First, patient data from Aim 1 will be matched to data from the organizational surveys, including the Primary Care and Chief of Staff Surveys. Second, staff from both high and low performing facilities identified in Aim 1 will be surveyed about specific organizational

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# Center News

Associate Center Director, **Dr. Michael Chapko**, was named Acting ACOS, Research and Development, and continues to oversee the local R&D office.

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**Dr. Stephan Fihn** co-chaired one of six workgroups charged by the Undersecretary for Health (USH) to develop strategies for moving VHA into the 21st century. The workgroup report, which addressed data management within VHA, was accepted by the USH and incorporated into the recently new VHA realignment plan. Dr. Fihn now co-chairs an implementation committee.

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In anticipation of continued Center growth, an additional 2,000 sq. ft. of office space has been obtained in our current office building. The Center will move into the new space in early 2011.

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**Dr. Larry Kessler**, Chair, University of Washington Health Services Department and member of the Center Steering Committee, recently received funding for a National Cancer Institute CHALLENGE grant *Advancing Innovative research-cancer diagnostic (ADVICE)* and will be collaborating with Center Investigators on this project.

## Improving communication and care at the end of life

**Lynn Reinke, ARNP, PhD**, was featured in the April 2010 issue of the ATS News, the newsletter of the American Thoracic Society. The story, "*Lynn Reinke: Improving Communication and Care at the End of Life*," highlights Dr. Reinke's training as a nurse and that has influenced her research. She works in collaboration with fellow ATS member and HSR&D Core Investigator **David Au, MD, MS**. <http://www.thoracic.org/newsroom/ats-news/resources/april-2010.pdf>

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## Research by Gayle Reiber featured in single-topic issue of JRRD

Research on prosthetics and traumatic limb loss by **Gayle Reiber, PhD, MPH**, was featured in the July 2010 single-topic issue of the Journal of Rehabilitation Research & Development (JRRD). <http://www.rehab.research.va.gov/jour/10/474/pdf/contents.pdf>

Dr. Reiber surveyed Vietnam war veterans and servicemembers/veterans from Operation Iraqi Freedom/Operation Enduring Freedom (OIF/OEF) who sustained major traumatic limb loss. 581 servicemembers/veterans participated in the survey generating a survey response rate of 62%. The Survey for Prosthetic Use is the first national survey on traumatic limb loss and collected information on combat injuries, health status, quality of life, and prosthetic device, use, function, rejection, and satisfaction.

Dr. Reiber's efforts to corroborate Department of Veterans Affairs (VA) and Department of Defense (DOD) paradigms on traumatic limb loss included the creation of a 27-member Expert Panel. The Panel was comprised of academic and clinical professionals, clinicians, VA and DOD researchers, and Veterans with limb loss.

The single-topic issue contains five guest editorials, nine scientific/technical articles, and resources for those with traumatic limb loss, including:

- ◆ Servicemembers and veterans with major traumatic limb loss from Vietnam war and OIF/OEF conflicts: Survey methods, participants, and summary findings
- ◆ Unilateral upper-limb loss: Satisfaction and prosthetic-device use in veterans and servicemembers from Vietnam and OIF/OEF conflicts
- ◆ Unilateral lower-limb loss: Prosthetic device use and functional outcomes in servicemembers from Vietnam war and OIF/OEF conflicts
- ◆ Multiple traumatic limb loss: A comparison of Vietnam veterans to OIF/OEF servicemembers
- ◆ Wheeled mobility: Factors influencing mobility and assistive technology in veterans and servicemembers with major traumatic limb loss from Vietnam war and OIF/OEF conflicts
- ◆ Comparison of satisfaction with current prosthetic care in veterans and servicemembers from Vietnam and OIF/OEF conflicts with major traumatic limb loss
- ◆ Quality of life for veterans and servicemembers with major traumatic limb loss from Vietnam and OIF/OEF conflicts
- ◆ Prosthetic cost projections for servicemembers with major limb loss from Vietnam and OIF/OEF
- ◆ Department of Veterans Affairs compensation and medical care benefits accorded to veterans with major limb loss

# Fellows' Profiles

*The Northwest Center is hosting five new VA Fellows in 2011.*

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**Martha (Molly) Billings, MD**, received a BA in Human Biology from Stanford University. She went to medical school at the University of California, San Francisco. She completed training in internal medicine at the University of California, Los Angeles and spent a year on faculty as a hospitalist. She moved to Seattle in 2006 for a fellowship in pulmonary and critical care medicine at the University of Washington. She subsequently completed a fellowship in Sleep medicine also at the UW. She now pursues research in obstructive sleep apnea investigating the predictors of CPAP adherence and the contributions of social factors.

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**Marc Blondon, MD**, began his fellowship with HSR&D in November 2010. Prior to entering the fellowship, Dr. Blondon was a fellow in General Internal Medicine at the University Hospital in Geneva, Switzerland, the same institution he earned his Doctor of Medicine (2002). Presently earning his Masters in Epidemiology from University of Washington, Dr. Blondon's interests lie in internal medicine, vascular medicine and clinical research. Dr. Blondon's most recent publications include *Thromboprophylaxis after cesarean section: decision analysis and Diagnostic strategy and comparison of clinical scores for pulmonary embolism*.

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**Laura Cecere, MD**, received her BS with honors in microbiology from Texas A&M and graduated from the University of Texas Southwestern Medical School in June 2002. She completed her internship and residency at the University of Washington and started as a Senior Fellow in 2007 in the UW Division of Pulmonary and Critical Care Medicine. Dr. Cecere's research, Long-term survival after hospitali-

zation for community-acquired and healthcare-associated pneumonia, was recently published in *Respiration* [2010; 79 (2):128-136].

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**Joel Grossbard, PhD**, received his Ph.D. in clinical psychology from the University of Washington in August 2010, and started the Ph.D. Postdoctoral Fellowship at HSR&D in October 2010 (previously received BA in psychology from Colby College and MA in developmental psychology from Tufts University). Research and clinical interests focus generally on the etiology and treatment of health-related risk behaviors, with a specific focus on motivational enhancement-based interventions targeting substance use, exercise, and co-morbid mental health conditions (depression, anxiety). Recent publications include "Substance use patterns among first-year college students: Secondary effects of a combined alcohol intervention" in *Journal of Substance Use Treatment*.

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**Edwin Wong, PhD**, earned his BS with honors in computer science from Texas Christian University, and his MA and PhD in economics from the University of Washington. His research interests include health services and economics, obesity, the economics of aging, labor economics and applied microeconomics. He works under the direction of Chuan-Fen Liu and is currently involved in the Organizational Correlates of Adherence to Medication project. Recent activities include research on the cost impacts of medication adherence among diabetic patients, evaluating the cost effectiveness of bariatric surgery and analyzing the determinants and economic implications of subjective survival beliefs.

*Drs. Christopher Bryson, Katharine Bradley and Stephan Fihn continue to co-direct the HSR&D MD Fellowship Program and Drs. Bryson and Bradley direct the University of Washington Internal Medicine NRSA Primary Care training grant. Dr. Gayle Reiber directs the HSR&D PhD Fellowship Program and Dr. Ken Hammond directs the Medical Informatics Fellowship Program. The HSR&D and NRSA trainees currently hold joint Works in Progress Seminars, creating a more robust and diverse health services environment for our trainees and investigators in the local community.*

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## Past Fellows

**Lynn Reineke, ARNP, PhD** accepted a nursing position with VA Puget Sound and continues to work at the Center on her NRI funded research study, *Palliative Care Needs for Veterans with Lung Cancer*.

**Dr. Lauren Beste, MD**, submitted her Career Development Award to HSR&D for funding consideration in December 2010.

**Dr. Stephen Bradley, MD**, re-submitted his Career Development Award to HSR&D for funding consideration.

## Research funded in 2010

**Patient Centered Adherence Intervention after Acute Cardiac Syndrome Hospitalization** (IIR 08-301, Christopher L. Bryson, MD, MS)

**Predicting Implementation from Organizational Readiness to Change** (IIR 09-067, Christian D. Helfrich, PhD)

**Outcomes, Costs, and Trends in Dialysis Timing in VA** (IIR 09-094, Paul L. Herbert, PhD)

**Evaluating the Impact of Cognitively Enhanced CPRS Document Interfaces** (IIR 09-061, Kenric Hammond, MD)

**Patient Aligned Care Team Demonstration Labs Coordinating Center** (XVA 61-041, Stephan D. Fihn, MD, MPH)

**Using AUDIT-C to Monitor Outcomes in Patients with Alcohol Misuse** (IIR 08-314, Katharine A. Bradley, MD, MPH)

**Appropriateness of Percutaneous Coronary Intervention** (RRP 09-140, Christopher L. Bryson, MD, MS)

**Implementing Alcohol Counseling with Clinical Reminders: Barriers and Facilitators** (RRP 09-178, Katharine A. Bradley, MD, MPH)

**Implementation of Long Term Care (LTC) Resource and Shared Decision Making Guide** (XVA 61-043, Sheri Reder, PhD)

**Process Oriented Validated Electronic Performance Measures** (RRP 09-139, Christopher L. Bryson, MD, MS)

## BRYSON continued from cover

practices, processes, and programs in use at their facility. Additionally, we will follow-up with qualitative telephone interviews to collect additional data on refill and renewal processes and specific initiatives to improve medication adherence.

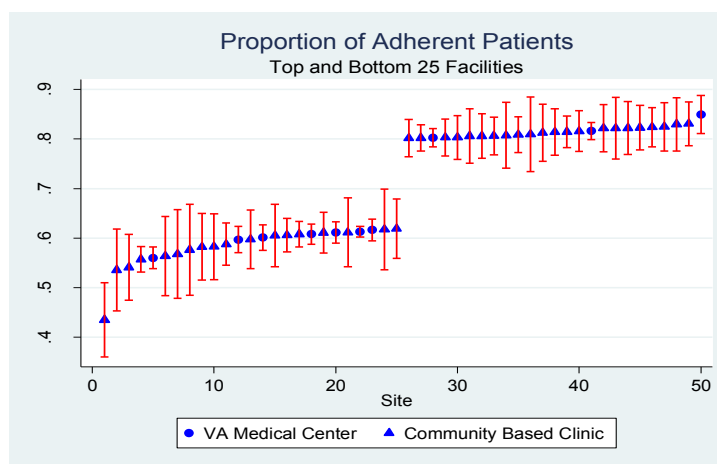
Aim 3 assesses individual patient knowledge and perceptions of organizational initiatives described by primary care staff from Aim 2. Qualitative interviews in focus group sessions will ask patients to describe their experiences, focusing on facilitators and barriers to medication adherence. This data collection may produce novel perceptions and suggestions regarding medication adherence.

## RESULTS

Data for Aims 1 and 2 have been obtained and most analyses have been completed. Patient focus groups are being initiated.

Results presented at the 2009 and 2010 Society for General Internal Medicine Meetings note that overall adherence to oral hypoglycemic agent medications is suboptimal. There is substantial variation among VA facilities in the proportion of patients who are adherent to their medications for diabetes, with 20-40% of patients not having medication available for at least 18 days of each 90 day interval. Adjustment for available patient characteristics did not significantly change either adherence or ranking. Adherence measured over 1 year rather than over 90 days was systematically lower, but same patterns and significant differences were observed.

As data collection for Aim 3 and continued analyses from Aims 1-3 are completed, VA researchers can expect to see study results disseminated to HSR&D QUERI groups and VA Office of Quality and Performance, in addition to peer reviewed journals and national meetings.



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## WILLIAMS continued from back

### What do you like to do to unwind from grant writing?

Yoga, fiction reading (a long engrained habit born of being the daughter of English professors), dinners out, and, in the summers, swims in Lake Washington. But mostly yoga.



# Publication Highlights

**Bradley KA**, Lapham GT, Hawkins EJ, Achtmeyer CE, **Williams EC**, Thomas RM, **Kivlahan DR**. Quality concerns with routine alcohol screening in VA clinical settings. *Journal of General Internal Medicine*. 2010 Sept 22; [Epub ahead of print].

Burgess JF, Maciejewski ML, **Bryson CL**, **Chapko MK**, Fortney JC, Perkins M, Sharp ND, **Liu CF**. Importance of health system context for evaluating utilization patterns across systems. *Health Economics*. 2010 Feb 20; 20(2):239-51.

**Chapko MK**, Yee HS, Monto A, **Dominitz JA**. Cost-effectiveness of Hepatitis A vaccination for individuals with chronic Hepatitis C. *Vaccine*. 2010 Feb 17; 28(7):1726-31.

**Fan VS**, Bridevaux PO, McDonnell MB, **Fihn SD**, Besser LM, **Au DH**. Regional variation in health status among chronic obstructive pulmonary disease patients. *Respiration*. 2011; 81(1):9-17 [Epub 2010 Aug 17].

**Gerlock AA**, Buccheri R, Buffum MD, Trygstad L, Dowling GA. Responding to command hallucinations to harm: the unpleasant voices scale and hard safety protocol. *Journal of Psychosocial Nursing and Mental Health Services*. 2010 May 1; 48(5):26-33.

Holt DT, **Helfrich CD**, Hall CG, Weiner BJ. Are you ready? How health professionals can comprehensively conceptualize readiness for change. *Journal of General Internal Medicine*. 2010 Jan 1; 25 Suppl 1:50-5.

**Lin D**, **Zhou XH**. A model for adjusting for nonignorable verification bias in estimation of the ROC curve and its area with likelihood-based approach. *Biometrics*. 2010 Dec; 66(4):1119-28.

**Maynard CC**, Flohr B, Guagliardo TA, Martin CH, McFarland LV, Pruden JD, **Reiber GE**. Department of Veterans Affairs compensation and medical care benefits accorded to veterans with major limb loss. *Journal of Rehabilitation Research and Development*. 2010 Jul 1; 47(4):403-408.

**O'Hare AM**, Hailpern SM, Pavkov ME, Rios-

Burrows N, Gupta I, **Maynard CC**, Todd-Stenberg J, Rodriguez RA, Hemmelgarn BR, Saran R, Williams DE. Prognostic implications of the urinary albumin to creatinine ratio in veterans of different ages with diabetes. *Archives of Internal Medicine*. 2010 Jun 14; 170(11):930-6.

**Reiber GE**, McFarland LV, Hubbard S, **Maynard CC**, Blough DK, Gambel JM, Smith DG. Servicemembers and veterans with major traumatic limb loss from Vietnam War and OIF/OEF conflicts: Survey methods, participants, and summary findings. *Journal of Rehabilitation Research and Development*. 2010 Jul 1; 47(4):275-97.

Rubinsky AD, **Kivlahan DR**, Volk RJ, **Maynard CC**, **Bradley KA**. Estimating risk of alcohol dependence using alcohol screening scores. *Drug and Alcohol Dependence*. 2010 Apr 1; 108(1-2):29-36.

**Steele BG**, Belza B, Cain K, Coppersmith J, Howard J, Lakshminarayan S, Haselkorn J. The impact of chronic obstructive pulmonary disease exacerbation on pulmonary rehabilitation participation and functional outcomes. *J Cardiopulm Rehabil Prev*. 2010 Jan; 30(1):53-60.

**Trivedi RB**, Ayotte BJ, Thorpe CT, Edelman D, Bosworth HB. Is there a nonadherent subtype of hypertensive patient? A latent class analysis approach. *Patient Preference and Adherence*. 2010 Jul 21; 4:255-62.

**Williams EC**, Lapham GT, Achtmeyer CE, Volpp B, **Kivlahan DR**, **Bradley KA**. Use of an electronic clinical reminder for brief alcohol counseling is associated with resolution of unhealthy alcohol use at follow-up screening. *Journal of General Internal Medicine*. 2010 Jan 1; 25 Suppl 1:11-7.

**Zeliadt SB**, Moinpour SD, Blough DK, Peterson DF, Hall IJ, Smith JL, Ekwueme DU, Thompson IM, Keane TE, Ramsey SD. Preliminary treatment considerations among men with newly diagnosed prostate cancer. *The American Journal of Managed Care*. 2010 May 1; 16(5):e121-30.

**Regional variation in health care intensity and treatment practices for end-stage renal disease in older adults.** O'Hare AM, Rodriguez RA, Hailpern SM, Larson EB, Kurella TM. **JAMA: The Journal of the American Medical Association**. 2010 Jul 14; 304(2):180-186.

Regional variations were examined in dialysis treatment practices among a national cohort of 41,420 adults (of white or black race), aged 65 years or older, who started long-term dialysis or received a kidney transplant between June 1, 2005, and May 31, 2006. Large differences were found in rates of dialysis initiation and discontinuation across regions with different patterns of Medicare spending and utilization. Patients living in high regions with the greatest spending and utilization were more likely to initiate dialysis.

Among patients who died within 2 years of end-stage renal disease (ESRD) onset (n = 21, 190), those living in these higher intensity regions were less likely to have discontinued dialysis before death (22.2% vs. 44.3%), less likely to have received hospice care (20.7% vs. 33.5%), and more likely to have died in the hospital (67.8% vs. 50.3%). These differences persisted in adjusted analyses.

In conclusion, there were large unexplained regional variations in end-of-life care practices for older adults with ESRD, likely reflecting substantial practice variation in this area.

# New Investigator Profile

The Northwest Center would like to welcome our newest Core Investigator, **Emily Williams, PhD, MPH**. Emily received her MPH from Boston University in 2003, PhD from the University of Washington in 2009, and has been conducting research related to management of unhealthy alcohol use in medical settings for the last 8 years.

## What are your research plans as a Core Investigator?

My core research interests are decision-making in health and health care (patient, provider, and system-level decision making), stigmatized chronic conditions, and social and cultural determinants of health and healthcare. My proximal plans include:

- Continuing evaluations of implementation of alcohol screening and brief alcohol counseling in the VA. In particular, I am interested in current and future qualitative studies to see how screening and counseling are being implemented on the ground across VA clinics and facilities.
- Evaluating whether the care we are implementing is being received equitably across sub-populations of the VA population (i.e., racial/ethnic, gender, urban/rural), and whether that care is equally effective across sub-populations. Exploring health services issues related to both HIV and alcohol.



*Emily Williams, PhD, MPH*

## What has facilitated your success in research to date?

I have collaborated with Kathy Bradley, MD, MPH for the past 8 years to develop and disseminate a population- and evidence-based approach to management of unhealthy alcohol use in the VA. The opportunity to be mentored by a leader in the field who takes a hands-on approach to mentorship was invaluable in fostering my intellectual growth and helping me to hone my research skills and develop expertise in specific areas of implementation research and behavioral health.

## Your academic background begins with a Bachelor of Arts in Political Science. What drew you to Health Services?

I was drawn to political science because I was moved by political theory. Specifically, once I was exposed to them, I could not stop thinking and talking about theories of human nature and the inherent and learned factors that affect how we make choices, both individually and as a society. My interest in public health and health services research is essentially the same thing—a core interest in why we make the health-related decisions we make, how we change our behaviors, and what structures are needed to facilitate effective and healthy living for everyone.

## You served as Traveling Faculty with the International Honors Program (IHP), Health and Community track over 2009/2010. How has that experience influenced your research interests?

My experience with the International Honors Program's Health and Community track, and in particular, my experience in South Africa, re-ignited an old interest in HIV, which I am excited about exploring. More generally, IHP showed me that we are living in an increasingly global world in which it is growing increasingly possible and important to learn from the experiences of other countries as we all work to provide healthcare efficiently, effectively, and equitably. Conversely, IHP further engrained in me the importance of carefully considering cultural context when developing and implementing interventions to improve healthy behaviors and health outcomes. I suspect both of those lessons will inform the development of my research program.

## Affiliate Investigators

Jason Dominitz, MD, MHS  
Bradford L. Felker, MD  
April Gerlock, PhD  
Barry Goldstein, MD, PhD  
Kenric Hammond, MD  
Margaret Hammond, MD  
Suparna Rajan, PhD, MS  
Sheri Reder, PhD  
Bonnie Steele, PhD, RN  
Rhonda Williams, PhD  
Bessie Young, MD

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